

RECEIVED

DEC 07 2001

TECH CENTER 1600/2900

Page 1

OIPE

RAW SEQUENCE LISTING

DATE: 11/15/2001

PATENT APPLICATION: US/09/646,568

TIME: 09:01:02

Input Set : A:\N74368B US DMG IJB HF SJB seq listing Sept 01.txt

Output Set: N:\CRF3\11152001\I646568.raw

C--> 3 <110> APPLICANT: ST GEORGE'S HOSPITAL MEDICAL SCHOOL
5 <120> TITLE OF INVENTION: DIAGNOSTICS AND VACCINES FOR MYCOBACTERIAL INFECTIONS
6 OF ANIMALS AND HUMANS
8 <130> FILE REFERENCE: N74368B DMG
10 <140> CURRENT APPLICATION NUMBER: US 09/646,568
11 <141> CURRENT FILING DATE: 2000-11-09
13 <150> PRIOR APPLICATION NUMBER: PCT/GB99/00849
14 <151> PRIOR FILING DATE: 1999-03-18
16 <150> PRIOR APPLICATION NUMBER: UK 9806093.2
17 <151> PRIOR FILING DATE: 1998-03-20
19 <160> NUMBER OF SEQ ID NOS: 5
21 <170> SOFTWARE: PatentIn Ver. 2.1
23 <210> SEQ ID NO: 1
24 <211> LENGTH: 1335
25 <212> TYPE: DNA
26 <213> ORGANISM: Mycobacterium avium
28 <400> SEQUENCE: 1
29 gtgactgaag ccaatgagtg caactcggcg tcgcgaaagg tttcagtcgc ggttgagcaa 60
30 gacaccgcaa gactactgga gtgcgtgcac aagcgcccc agctcgcggc tgaaagcgga 120
31 tgcaaagggg ttgaaagctt gagcaacatg cgaaggggag aacggcctat gagcctggga 180
32 cagggttttcg acccgcgcg cgaatgcactt aatgcgtggc gcttggtgtt ggcgagcggg 240
33 gtgactcctat ggcattcgtt tccgctcact ggacgtatgc cgtgggcgcc gttcgtccag 300
34 ttgcttgccc ttggatgcgt tgatgggttc tttgcgggtc ccggctatct catcgtctcg 360
35 agctggcttc gcaacccgca tcccgcacca taactcaccg ctcgatgtct tcgtattctc 420
36 ccgggtctgt ggatctgtct catcttgacg gcgtttgtca tcgctccgat aggtgtgggc 480
37 gccagggcg gttcggccgc gaaactactg atgtccggcg ctccgatcga gtatgtgcta 540
38 aaagacagtg cggtttgat ggtaagtgc gatatcggg gcacacctcg cgatattcca 600
39 gttgcgggta ttgggaacgg ttctctgttg acattgggtt gggagggtgt ttgctatata 660
40 ggcgtagcag tatttggtat gctcggactt cttagtcgcc gttggttcgt tccagggata 720
41 ttgactcctg cgtcgtcgtg gtcggtgttc ttgcggcat ggggcggaat acacgcgac 780
42 gcctccaatg ctgcgcgatt cgtcgtgatg ttttcggccg gagcgttgct gtatcaattc 840
43 cgtaacgtga ttccggctcg gtggtccttc gttgccgctg gcctcattat cgttggtggt 900
44 tcctctgccg tgctgccgga ctaccggttg gtggcgccc ttccgatggc gtacctaata 960
45 atcgtctcgg gttcgtctat ccacaatcaa aggatgaggt tccgcaccga tctatcctat 1020
46 ggagtatata tttatgcgtt tccaattcag caagtgcgtg tctgtgtgg attcgcggag 1080
47 ataaatccaa tcgctttctg cgcgatttct gtcgcagcta ttttgccgct cgcgcgctc 1140
48 agttggttct tggctgagaa acctgcgttg tctggaaga gtcgtctccg gcggaaaaac 1200
49 agttcaattg cgtagcccaa tatggaagat ggtggatcag tcggccgctc aaatgacatt 1260
50 cccggaaggc gggcccgtt tattggcgag aaagccgaag atcctcccgc gccgagccca 1320
51 agaccggctt tgtaa 1335
53 <210> SEQ ID NO: 2
54 <211> LENGTH: 444
55 <212> TYPE: PRT
56 <213> ORGANISM: Mycobacterium avium
58 <400> SEQUENCE: 2
59 Val Thr Glu Ala Asn Glu Cys Asn Ser Ala Ser Arg Lys Val Ser Val
60 1 5 10 15

ENTERED

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/646,568

DATE: 11/15/2001

TIME: 09:01:02

Input Set : A:\N74368B US DMG IJB HF SJB seq listing Sept 01.txt
 Output Set: N:\CRF3\11152001\I646568.raw

```

62 Ala Val Glu Gln Asp Thr Ala Arg Leu Leu Glu Cys Val His Lys Arg
63          20          25          30
65 Pro Gln Leu Ala Ala Glu Ser Gly Cys Lys Gly Val Arg Ser Leu Ser
66          35          40          45
68 Asn Met Arg Arg Gly Glu Arg Pro Met Ser Leu Gly Gln Val Phe Asp
69          50          55          60
71 Pro Arg Ala Asn Ala Leu Asn Ala Trp Arg Leu Val Leu Ala Ser Gly
72 65          70          75          80
74 Val Ile Leu Trp His Ser Phe Pro Leu Thr Gly Arg Met Pro Trp Ala
75          85          90          95
77 Pro Phe Val Gln Leu Leu Gly Leu Gly Cys Val Asp Gly Phe Phe Ala
78          100          105          110
80 Val Ser Gly Tyr Leu Ile Val Ser Ser Trp Leu Arg Asn Pro His Pro
81          115          120          125
83 Ala Gln Tyr Phe Thr Ala Arg Cys Leu Arg Ile Leu Pro Gly Leu Trp
84          130          135          140
86 Ile Cys Leu Ile Leu Thr Ala Phe Val Ile Ala Pro Ile Gly Val Gly
87 145          150          155          160
89 Ala Gln Gly Gly Ser Ala Ala Lys Leu Leu Met Ser Gly Ala Pro Ile
90          165          170          175
92 Glu Tyr Val Leu Lys Asp Ser Ala Val Trp Met Val Lys Phe Asp Ile
93          180          185          190
95 Gly Gly Thr Pro Arg Asp Ile Pro Val Ala Gly Ile Trp Asn Gly Ser
96          195          200          205
98 Leu Trp Thr Leu Gly Trp Glu Val Leu Cys Tyr Ile Gly Val Ala Val
99          210          215          220
101 Phe Gly Met Leu Gly Leu Leu Ser Arg Arg Trp Phe Val Pro Gly Ile
102 225          230          235          240
104 Leu Ile Leu Ala Leu Ser Trp Ser Val Phe Leu Pro Ala Trp Gly Gly
105          245          250          255
107 Ile His Ala Ile Ala Ser Asn Ala Ala Arg Phe Ala Val Met Phe Ser
108          260          265          270
110 Ala Gly Ala Leu Leu Tyr Gln Phe Arg Asn Val Ile Pro Ala Arg Trp
111          275          280          285
113 Ser Phe Val Ala Val Gly Leu Ile Ile Val Val Val Ser Ser Ala Val
114          290          295          300
116 Leu Pro Asp Tyr Arg Leu Val Ala Ala Leu Pro Met Ala Tyr Leu Ile
117 305          310          315          320
119 Ile Ala Ser Gly Ser Leu Ile His Asn Gln Arg Met Arg Phe Arg Thr
120          325          330          335
122 Asp Leu Ser Tyr Gly Val Tyr Ile Tyr Ala Phe Pro Ile Gln Gln Val
123          340          345          350
125 Leu Val Leu Cys Gly Phe Ala Glu Ile Asn Pro Ile Ala Phe Cys Ala
126          355          360          365
128 Ile Ser Val Ala Ala Ile Leu Pro Leu Ala Ala Leu Ser Trp Phe Leu
129          370          375          380
131 Val Glu Lys Pro Ala Leu Ser Trp Lys Ser Arg Leu Arg Arg Lys Asn
132 385          390          395          400
134 Ser Ser Ile Ala Leu Ala Asn Met Glu Asp Gly Gly Ser Val Gly Arg

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/646,568

DATE: 11/15/2001

TIME: 09:01:02

Input Set : A:\N74368B US DMG IJB HF SJB seq listing Sept 01.txt

Output Set: N:\CRF3\11152001\I646568.raw

```

135                               405                               410                               415
137 Ser Asn Asp Ile Pro Gly Arg Arg Ala Arg Phe Ile Gly Glu Lys Ala
138                               420                               425                               430
140 Glu Asp Pro Pro Ala Pro Ser Pro Arg Pro Ala Leu
141                               435                               440
144 <210> SEQ ID NO: 3
145 <211> LENGTH: 2543
146 <212> TYPE: DNA
147 <213> ORGANISM: Mycobacterium avium
149 <400> SEQUENCE: 3
150 atgcactgtc aatggccaag tagaagtcgc cgctggtggc cagcagaagt cccactccg 60
151 ctgcgggttg ttggctaatt ctggcggtt cccttcttgt ggtcggcgtg gcgcatccg 120
152 taggactcgc cggaggtgac gacgatgctg gcgtggtgca gcagccgacg gaggatgctg 180
153 gcggcggttg tgtgctcggg caggaatcgc cccattgtt cgaagggcca atgcgaggcg 240
154 atggccaggg agcggcgctc gtagccggca gccacgagcc ggaacaacag ttgagtcccg 300
155 gtgtcgtcga gcggggcgaa gccgatctcg tccaagatga ccagatccgc gcggagcagg 360
156 gtgtcgtatg tcttgccgac ggtgttgctg gccaggccgc ggtagaggac ctcgatcagg 420
157 tcggcggcgg tgaagtagcg gactttgaat ccggcgtgga cggcagcgtg cccgcagccg 480
158 atgagcaggt gacttttgcc cgtaccaggt gggccaatga ccgccagggt ctggttggtc 540
159 cgaatccatt ccaggctcga caggtagtcg aacgtggctg cggtgatcga cgatccggtg 600
160 acgtcgaacc cgtcgagggt cttggtgacc ggggaaggctg cggccttgag acggttggtg 660
161 gtgttgaggg catcgcgggc agcgatctcg gccccaacca acgtccgcag gatctctcc 720
162 ggtgtccagc gttgcgtctt ggcgacttgc aacacctcgg cggcggttgcg gcgcaccgtg 780
163 gccagcttca accgccgcag cgcgcgctca aggtcagcag ccagcgggtg cgcgaggac 840
164 ggtgccaccg gcttggcagc ggtggtcatg aggcggtccc gtcggtggtg ttgatcttgt 900
165 aggcctccaa cgagcgggtc tcgacggttg gcagatcgag cacgagtgcg tcgccggcgg 960
166 ggcggggttg tgggtgcccg gcgccggcgg ccaggatcga gcgcacgtcg gcagcgcgga 1020
167 accggcgaaa cgcaaccgcc cggcgcgagc cgtcaatcaa agcctgttcg ccgtgggcgg 1080
168 cgccaaggcc gagcagaatg tcgagttcgg atttcagtcg ggtgttgccg atcgagcag 1140
169 caccgacgag gaactgctgc gcttcgggtt ccaatgcgca gaatcgtttc tctgcttggg 1200
170 ttttcgggcg aggaccacgc gagggtgctg gtctgggtcc gtcgtagtgt tcatcgagga 1260
171 tggacacctc acctgggctg acgagctcgt gtcgggccac gatcacaccg gtcgcagggt 1320
172 ccaacaggat cagggcgcca tgatcgacca ccaccgccac ggtggcaccg acgagccgct 1380
173 gaggcaccga gtaacgagct gagccgtaac ggatgcacga gaggccgtcg accttacggc 1440
174 gcaccgaccc cgagccgacg gtcggccgca gcgagggcag ctccctcaag acggtgcgct 1500
175 cgtcaaccaa gcgatcgttg ggcacggcgc agatctccga gtggaccgtg gcattgacct 1560
176 cgcgcgacca tagttgcgcc tgggcgttga gggcacgtag gtcgacctgc tcaccggcta 1620
177 acgcagcttc ggtcagcagc ggcaccgcaa ggtcgctcgt agcgtagcca cagaggttct 1680
178 ccacgatgcc cttcgattgc ggatccgcac cgtggcagaa gtccggaacg aagccatagt 1740
179 gggacgcgaa tcgcacataa tccggtgttg gaacaacaac attggcgacg acaccacctt 1800
180 tgaggcagcc catccggtcg gccaggatct tggccggaac cccaccgacg gcctcgaggg 1860
181 cttcggctat catcgctcgc gtggtcgagg ctttctcgtc ggccggcgaa cgtctaaacc 1920
182 gccaccgcca ataggccagc tccgcgcata acaccatcag ccccggtgcc gcttcggccc 1980
183 aatccatcac cagatagtca ccgggtgacc agaccgcggg acggcgttga tgccggttag 2040
184 cgttgcgcca ccatacttcc tgctcggcta ccaggcggcg gaagttagcg gccgagccct 2100
185 gatacccgcc agctcgggcg atcggcagca tccgcttcgc cgacatcttg ccgtgtgatt 2160
186 tctcgactcg ggtggcgact agatcgggtg acgcgtcgag gttgcgtggc cgtggttccc 2220
187 gcgggggcgc gccaccggcc tcggcccgtc cgatgacccg cttgaccgtc ttgtgcgtac 2280
188 taccgcacag ctcgccgcgc ccgcgatacg acccgacctg gtgatacgcc gaaatgatgt 2340

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/646,568

DATE: 11/15/2001

TIME: 09:01:02

Input Set : A:\N74368B US DMG IJB HF SJB seq listing Sept 01.txt

Output Set: N:\CRF3\11152001\I646568.raw

```

189 tcatacgtct ccttgacagac ttcaatagag ctccctgggc ggtgatcaag tgacagttgg 2400
190 cgctatcacc gtcaccgccc aggccctcag ctcccgaaa agacacgacg agcccgctaa 2460
191 ggagtgggga cttctacctg gccaccagtg gggacttcct actggccaca gatggggact 2520
192 ttctcatggc catggacatg cac                                     2543
194 <210> SEQ ID NO: 4
195 <211> LENGTH: 2543
196 <212> TYPE: DNA
197 <213> ORGANISM: Mycobacterium avium
199 <400> SEQUENCE: 4
200 gtgcatgtcc atggccatga gaaagtcccc atctgtggcc agtaggaagt ccccaactggt 60
201 ggccaggtag aagtccccac tccttagcgg gctcgtcgtg tcttttcogg gagctgaggg 120
202 cctgggcggg gacgggtgata gcgccaactg tcacttgatc accgcccagg gagctctatt 180
203 gaagtctgca agggagcgtg tgaacatcat ttccggcgtat caccaggctg ggtcgtatcg 240
204 cggcgcgggc gagctgtgcg gtagtacgca caagacggtc aagcgggtca tcgagcgggc 300
205 cgaggcgggt ggcgcgcccc cgcgggaacc acggccacgc aacctogacg cgttcaccga 360
206 tctagtgcgc acccgagtcg agaaatcaca cggcaagatg tcggcgaagc ggatgctgcc 420
207 gatcgcccca gctgcggggt atcagggtc gcgccgtaac ttccgcgcgc tggtagccga 480
208 gcaggaagta tgggtgcgca acgctaaccg gcatcaacgc cgtccggcgg tctggtcacc 540
209 cgggtgactat ctggtgatgg attgggcgca agcggcaccg gggctgatgg tgttatgcgc 600
210 ggagctgggc tattcgcggg ggcggtttga gcggttcgcc gccgacgaga aagcctcgac 660
211 cagcgaggcg atgatacgcg aagccctcga ggcgatcggg ggggttcogg ccaagatcct 720
212 ggccgaccgg atgggctgcc tcaaaggtgg tgcgtcgcgc aatgttgttg ttccaacacc 780
213 ggattatgtg cgattcgcgt ccactatgg ctctgttcgg gacttctgcc acggtgcgga 840
214 tccgcaatcg aagggcatcg tggagaacct ctgtggctac gctcaggacg accttgcggt 900
215 gccgtgctg accgaagctg cgttagccgg tgagcaggtc gacctacgtg cctcaacgc 960
216 ccaggcgcaa ctatggtgcg ccgaggtcaa tgccaacggt cactcggaga tctgcgccgt 1020
217 gccaacgat cgcttggttg acgagcgcac cgtcttgagg gagctgcctt cgctgcggcc 1080
218 gacgatcggc tcggggtcgg tgcgccgtaa ggtcgacggc ctctcgtgca tccgttacgg 1140
219 ctacgtcgt tactcgggtc ctacgcggct cgtcgggtgc accgtggcgg tgggtggtcga 1200
220 tcatggcgcc ctgatcctgt tggaaacctgc gaccgggtgt atcgtggccg agcacgagct 1260
221 cgtcagccca ggtgaggtgt ccatcctcga tgaacactac gacggacca gaccgcacc 1320
222 ctgcgtggtt cctcgcccga aaacccaagc agagaaacga ttctgcgcgt tgggaaccga 1380
223 agcgcagcag ttctcgtcgt gtgctgctgc gatcggcaac acccgactga aatccgaact 1440
224 cgacattctg ctcggccttg gcgcgcgcca cggcgaaacg gctttgattg acgcgctgcg 1500
225 cggggcggtt gcgtttcgcc ggttcgcgcg tgccgacgtg cgtctgatec tggccgcggg 1560
226 cgccggcacc ccacaacccc gcccgcggc cgacgcactc gtgctcgatc tgcccaccgt 1620
227 cgagaccgca tcgttgaggg cctacaagat caacaccacc gacgggacgg cctcatgacc 1680
228 accgctgcca agccggtggc accgtcctcg ggcgcaccgc tggctgctga ccttgacgcg 1740
229 gcgctgcggc ggttgaagct ggccacggtg cgcgcgaacg ccgccgaggt gttgcaagtc 1800
230 gccaagacgc aacgctggac accggaggag atcctgcgga cgttggttga gccgagatc 1860
231 gctgcccgcg atgcctccaa caccgccaac cgtctcaagg ccgcagcctt cccggtcacc 1920
232 aagaccctcg acgggttcga cgtcacggga tcgtcgatca ccgcagccac gttcgactac 1980
233 ctgtcgagcc tggaaatgat tcgggcacaa cagaacctgg cggtcattgg cccacctggt 2040
234 acgggcaaaa gtcacctgct catcggtcgc gggcacgctg ccgtccacgc cggattcaaa 2100
235 gtccgctact tcaccgcgc cgacctgatc gaggtcctct acccgggcct ggccgacaac 2160
236 accgtcggca agatcatcga caccctgctc cgcgcggatc tggatcatct ggacgagatc 2220
237 ggcttcgccc cgctcgacga caccgggact caactgttgt tccggctcgt ggctgcgggc 2280
238 tacgagcgcc gctccctggc catcgctcgt cattggccct tcgaacaatg ggggcgattc 2340
239 ctgcccgcgc acaccaccgc cgcacgcatc ctcgatcggc tgctgcacca cgcacgcatc 2400

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/646,568

DATE: 11/15/2001

TIME: 09:01:02

Input Set : A:\N74368B US DMG IJB HF SJB seq listing Sept 01.txt

Output Set: N:\CRF3\11152001\I646568.raw

```

240 gtcgtcacct cggcgagtc ctaccggatg cgccacgccg accacaagaa gggagccgcc 2460
241 aagaattagc caaccacccg cagcggagtg gggacttctg ctggccacca gcggggactt 2520
242 ctacttggcc attgacagt cat 2543
244 <210> SEQ ID NO: 5
245 <211> LENGTH: 526
246 <212> TYPE: PRT
247 <213> ORGANISM: Mycobacterium avium
249 <400> SEQUENCE: 5
250 Val Ser Phe Pro Gly Ala Glu Gly Leu Gly Gly Asp Gly Asp Ser Ala
251 1 5 10 15
253 Asn Cys His Leu Ile Thr Ala Gln Gly Ala Leu Leu Lys Ser Ala Arg
254 20 25 30
256 Glu Arg Met Asn Ile Ile Ser Ala Tyr His Gln Val Gly Ser Tyr Arg
257 35 40 45
259 Gly Ala Ala Glu Leu Cys Gly Ser Thr His Lys Thr Val Lys Arg Val
260 50 55 60
262 Ile Glu Arg Ala Glu Ala Gly Gly Ala Pro Pro Arg Glu Pro Arg Pro
263 65 70 75 80
265 Arg Asn Leu Asp Ala Phe Thr Asp Leu Val Ala Thr Arg Val Glu Lys
266 85 90 95
268 Ser His Gly Lys Met Ser Ala Lys Arg Met Leu Pro Ile Ala Arg Ala
269 100 105 110
271 Ala Gly Tyr Gln Gly Ser Ala Arg Asn Phe Arg Arg Leu Val Ala Glu
272 115 120 125
274 Gln Glu Val Trp Trp Arg Asn Ala Asn Arg His Gln Arg Arg Pro Ala
275 130 135 140
277 Val Trp Ser Pro Gly Asp Tyr Leu Val Met Asp Trp Ala Glu Ala Ala
278 145 150 155 160
280 Pro Gly Leu Met Val Leu Cys Ala Glu Leu Ala Tyr Ser Arg Trp Arg
281 165 170 175
283 Phe Glu Arg Phe Ala Ala Asp Glu Lys Ala Ser Thr Thr Gln Ala Met
284 180 185 190
286 Ile Ala Glu Ala Leu Glu Ala Ile Gly Gly Val Pro Ala Lys Ile Leu
287 195 200 205
289 Ala Asp Arg Met Gly Cys Leu Lys Gly Gly Val Val Ala Asn Val Val
290 210 215 220
292 Val Pro Thr Pro Asp Tyr Val Arg Phe Ala Ser His Tyr Gly Phe Val
293 225 230 235 240
295 Pro Asp Phe Cys His Gly Ala Asp Pro Gln Ser Lys Gly Ile Val Glu
296 245 250 255
298 Asn Leu Cys Gly Tyr Ala Gln Asp Asp Leu Ala Val Pro Leu Leu Thr
299 260 265 270
301 Glu Ala Ala Leu Ala Gly Glu Gln Val Asp Leu Arg Ala Leu Asn Ala
302 275 280 285
304 Gln Ala Gln Leu Trp Cys Ala Glu Val Asn Ala Thr Val His Ser Glu
305 290 295 300
307 Ile Cys Ala Val Pro Asn Asp Arg Leu Val Asp Glu Arg Thr Val Leu
308 305 310 315 320
310 Arg Glu Leu Pro Ser Leu Arg Pro Thr Ile Gly Ser Gly Ser Val Arg

```

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/646,568

DATE: 11/15/2001

TIME: 09:01:03

Input Set : A:\N74368B US DMG IJB HF SJB seq listing Sept 01.txt

Output Set: N:\CRF3\11152001\I646568.raw

L:11 M:271 C: Current Filing Date differs, Replaced Current Filing Date